

Edmodo  
Group Code:  
**9ps7cz**

# Building BIG

NCAGT CONFERENCE 2016

WINSTON-SALEM, NC

## Onslow County Schools

Heather Smith, AIG Specialist

Maria Burdette, AIG Specialist

Katherine Collins, Digital Learning & Technology Facilitator

# Resources:

- ▶ Join our Edmodo Group:



Group Code:

**9ps7cz**

- ▶ Onslow County Schools AIG Website:

[www.onslowaig.weebly.com](http://www.onslowaig.weebly.com)

- ▶ [www.symbaloo.com/mix/buildingbig](http://www.symbaloo.com/mix/buildingbig)

# Onslow County Schools

## AIG

### ▶ Heather Smith, AIG Specialist

- ▶ [Heather.Smith@onslow.k12.nc.us](mailto:Heather.Smith@onslow.k12.nc.us)
- ▶ Summersill Elementary @ SSE\_AIG
- ▶ Bell Fork Elementary @ BFE\_AIG



### ▶ Maria Burdette, AIG Specialist

- ▶ [Maria.Burdette@onslow.k12.nc.us](mailto:Maria.Burdette@onslow.k12.nc.us)
- ▶ Jacksonville Commons Elementary
- ▶ Stateside Elementary

#OnslowAIG

#OnslowDLT

# Onslow County Schools

## Digital Learning & Teaching

### ► Katherine Collins

- [Katherine.Collins@onslow.k12.nc.us](mailto:Katherine.Collins@onslow.k12.nc.us)
- Clyde Erwin Elementary Magnet School
  - School Website <http://goo.gl/trtNQy>
- Digital Teaching and Learning Twitter  
@katcollins1103



**#OnslowAIG**

**#OnslowDLT**

# 1:1 Initiative/Background



The OCS Tiered Technology Vision began in 2007.

- ▶ Tier 1- Teacher Productivity: This gave all teachers laptops to use.
- ▶ Tier 2- Classroom Productivity: Interactive boards, document camera, and digital projectors
- ▶ Tier 3- Student Productivity (1:1) : Local initiative for teachers to apply for Tier 3 grants and POD (Personally Owned Devices)

# 1:1 Initiative/Background

The OCS 1:1 Initiative began the 2014-2015 school year.

## 1:1 Roll Out Timeline

2014-2015 Grades 7-9

2015-2016 Grades 5, and 10

2016-2017 Grades 4, 6 and 11

2017-2018 Grades 3 and 12

2018-2019 Grades K-2 Local Initiative

# 1:1 Initiative/Platform



## Digital Learning and Teaching Platform



# 1:1 Initiative/Platform



Edmodo is a LMS (learning management system) that allows for teachers to communicate and manage students' learning through notes, polls, quizzes, assignments, Snapshots, an agenda, and apps.



A Global Gateway system that offers an integrated platform of professional development, lesson plans, resources etc... to help educators support global competence with their students.



Common Sense Media is used to support the teaching of Digital Citizenship to grades K-12.



This is our current benchmark assessment resource for ELA, math, and science.



# 1:1 Initiative/Platform



This houses PowerSchool resources (PowerTeacher, NCEES, SchoolNet, & PowerTeacher Admin)



Office 365 is available for both teachers and students and allows students to use online versions of Microsoft Office products. Students also can use OneNote, SWAY, and Mix. Sharing and Syncing are well underway in Onslow County Schools.



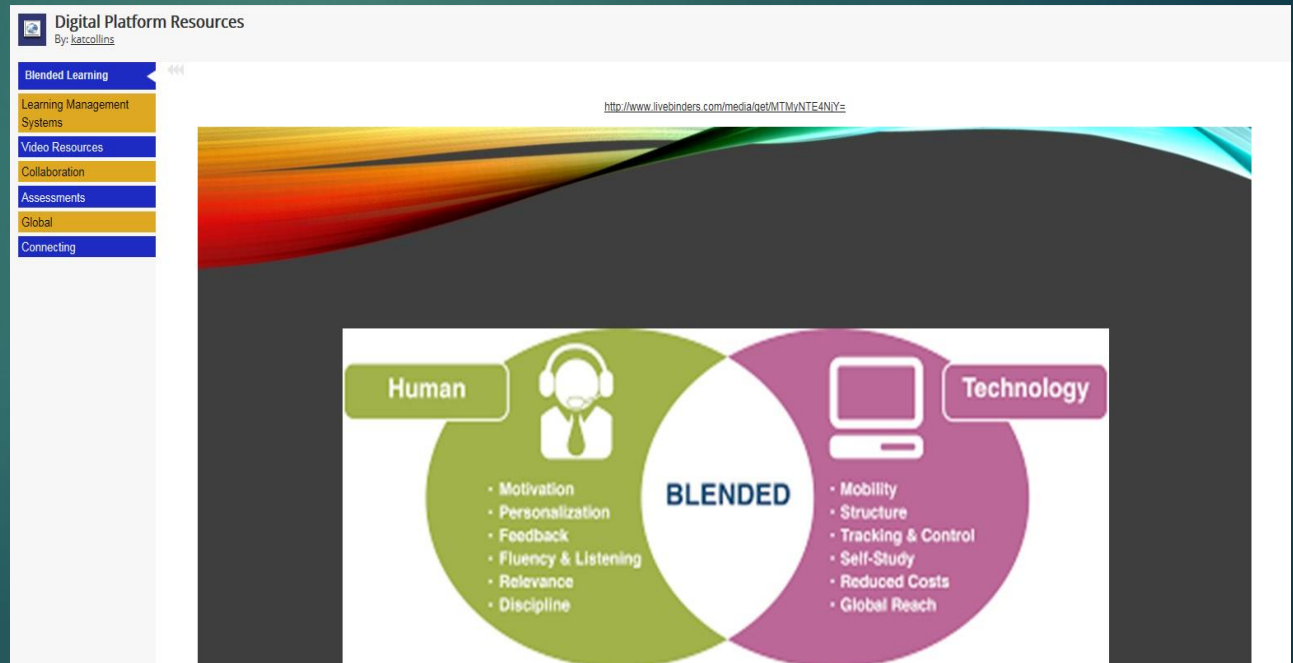
OnslowView allows classrooms to video conference with other schools and places with a Cisco system for virtual field trip and collaboration experiences.



# Technology Platform Alternatives

The idea behind having a platform is to have resources that target specific areas of digital learning.

- Learning Management System (LMS), Formative Assessments, Video, Collaboration & Communication, etc...
- The QR code takes you to a Livebinder with alternative resources.



# Standards of Practice

## for Digital Learning & Teaching Environments

### ILS / LMS

- Both teacher and student actively engage on Edmodo and/or Office365 regularly.
- Syllabus or "Year at a Glance" are present on the Edmodo class page.
- Students and teachers utilize Office365 for file storage.
- Bellwork/Homework/Assignments are evident on Edmodo and/or Office365.
- Edmodo and/or Office365 are used for assignment submission and feedback.
- Students keep their Edmodo and/or Office365 calendars current and informative.

The purpose behind incorporating the use of a Class Notebook through Office 365 is to support the county's technology platform and Standards of Practice. The use of Class Notebook has also made sharing, completing, and viewing assignments easy and quick.

# Onslow County Schools

## AIG Elementary Services

- ▶ Grades 3-5 in pull-out setting at most elementary schools
- ▶ 2 to 3 contacts weekly
- ▶ Building BIG is an all-inclusive unit
  - Reading, Math, & Nonverbally Gifted
  - Social/Emotional Skills
  - 4<sup>th</sup> or 5<sup>th</sup> grade

# Building BIG Resources

Each AIG group is different.

- ▶ Size
- ▶ Ability levels
- ▶ Interests
- ▶ Social Skills
- ▶ Backgrounds



## Make it work for your students!

# Building BIG



- ▶ Phase 1: Engineering
- ▶ Phase 2: Bridge Basics
- ▶ Phase 3: Business Design
- ▶ Phase 4: Construction
- ▶ Phase 5: Test and Analyze

# Phase 1: Engineering

## Essential Questions:

- ▶ What are civil engineers?
- ▶ What skills are important in order to be successful as a civil engineer?
- ▶ What is the future outlook for this career field?

### CCSS.ELA-LITERACY.RI.5.7

**Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.**



# Phase 1: Engineering

## Civil Engineering

- ▶ [US Department of Labor](#)
- ▶ [Live Science: Civil Engineering](#)
- ▶ Videos Located in OneNote & Symbaloo
  - ▶ What is Engineering?
  - ▶ What Do Civil Engineers Do?
  - ▶ Career Choices: Civil Engineers

### CCSS.ELA-LITERACY.RI.5.9

**Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.**



## OCCUPATIONAL OUTLOOK HANDBOOK

Search Handbook

Architecture and Engineering &gt;

## Civil Engineers

EN ESPAÑOL

PRINTER-FRIE

Summary

**What They Do**

Work Environment

How to Become One

Pay

Job Outlook

State &amp; Area Data

Similar Occupations

More

## What Civil Engineers Do

About this se

Civil engineers design, build, supervise, operate, and maintain construction projects and systems in the public and private sector, including roads, buildings, airports, tunnels, dams, bridges, and systems for water supply and sewage treatment. Many civil engineers work in design, construction, research, and education.

### Duties

Civil engineers typically do the following:

- Analyze long range plans, survey reports, maps, and other data in order to plan projects
- Consider construction costs, government regulations, potential environmental hazards, and other factors in planning the stages of, and risk analysis for, a project
- Compile and submit permit applications to local, state, and federal agencies, verifying that projects comply with various regulations
- Perform or oversee soil testing to determine the adequacy and strength of foundations
- Test building materials, such as concrete, asphalt, or steel, for use in particular projects
- Provide cost estimates for materials, equipment, or labor to determine a project's economic feasibility
- Use design software to plan and design transportation systems, hydraulic systems, and structures in line with industry and government standards



# Building B14

## Civil Engineers

U.S. Bureau of Labor

### Verbs

- Design
- Construct
- Supervise
- Operate
- Research
- Maintain • Repair
- Analyze • Educate
- Deconstruct
- Calculate
- Evaluate

### Nouns

- buildings • risks
- bridges • materials
- tunnels • costs
- dams • regulations
- water systems • maps
- transportation systems
- reports • permits
- tests • equipment
- labor • software

2014  
Chart Paper

✓ 1--Civil Engineering

Thursday, October 22, 2015 3:58 PM

EQ: What is a civil engineer?

Resources:

- [United States Department of Labor: Civil Engineers](#)
- [Video: What Do Civil Engineers Do?](#)

Complete this two-column table that lists verbs and nouns describing the jobs in the fields of civil engineering.

✓ H. Smith 11/9  
I loved how you  
used color coding  
to organize your  
thoughts!

Verbs	Nouns
<ul style="list-style-type: none"> <li>• Analyze</li> <li>• Manage</li> <li>• Surveying</li> <li>• Test</li> <li>• Consider</li> <li>• Planning</li> <li>• Provide</li> </ul>	<ul style="list-style-type: none"> <li>• Survey Reports</li> <li>• Maps</li> <li>• Data</li> <li>• Repair</li> <li>• Soil</li> <li>• Concrete</li> <li>• Asphalt</li> <li>• Steel</li> <li>• Construction cost</li> <li>• Environment hazards</li> <li>• Gov. regulations/laws</li> <li>• Risk analysis</li> <li>• Projects- houses, bridges</li> </ul>

2016  
OneNote  
Class Notebook

Views Page Setup Zoom Window

Building BIG  
\_Content Library

5 Civil Engineering Bridge Basics Business Information BFE Class Discussions

1--Civil Engineering BFE CLASS 11/9

Thursday, October 22, 2015 3:58 PM

# OneNote Class Discussion Notes

**EQ: What is a civil engineer?**

## Resources:

- [United States Department of Labor: Civil Engineers](#)
- [Video: What Do Civil Engineers Do?](#)

Complete this two-column table that lists verbs and nouns describing the jobs in the fields of civil engineering.

Verbs	Nouns
Analyze	Survey Reports Maps data
consider	-construction cost -environmental hazards -gov. regulations/laws
planning	-risk analysis

Absent

New  
Students


Nonverbal

Twice  
Exceptional


# Exit Tickets through Edmodo

Edmodo Assignment:

Write a 5<sup>th</sup> grade quality paragraph describing what you have learned about civil engineering.




Latest submission on Dec 2, 2015 @ 3:36 PM

8/8 

Request Resubmission

Civil engineers help people in many ways. They can help by building a bridge or a stadium roof. Civil engineers build all kinds of things(or fix and improve them). Civil engineers have a very important job to do. It's hard work, but it pays off in the end.



Me • Dec 8, 2015  
Great Job!

# Phase 2: Bridge Basics

## Essential Questions:

- ▶ How do forces, materials, and shapes effect bridge design and efficiency?
- ▶ What are the advantages and disadvantages of:
  - beam bridges?
  - arch bridges?
  - truss bridges?
  - suspension bridges?

### CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

# Phase 2: Bridge Basics

## ▶ **PBS Building BIG Website**

- Forces, Load, & Materials Labs
- Bridge Basics
- Craggy Rock Challenge

## ▶ Gumdrops or Paper Bridge Challenges

## ▶ Bridge Bundle (TPT--\$3.00)

## ▶ Vocabulary Review in OneNote

## ▶ Cargo Bridge (online game)



# PBS Building BIG Lab Notes


Building BIG

[Home](#) | [Site Map](#) | [Labs](#) | [Databank](#) | [Glossary](#)

FORCES | LOADS | MATERIALS | SHAPES

Bridges  
Domes  
Skyscrapers  
Dams  
Tunnels

Buy the DVD



The weight pushes down on the rectangle and causes the top side to bend.

The weight presses down on the arch and is spread outward along the curve to the ground below.

The weight causes the top two sides to squeeze together and the bottom side to pull apart.

ABOUT THIS LAB

9  
6  
3  
1

Online Lab provides students opportunities to manipulate how forces, loads, materials and shapes effect bridges.



Building BIG 5

Civil Engineering Business Information Bridge Design +

✓ 1--Bridge Basics

Thursday, October 22, 2015 4:42 PM

EQ: How do forces, materials, and shapes effect bridge design and efficiency?

Resource:

- [PBS Forces, Loads, Materials, & Shapes Labs](#)
- [Video: Triangles in Architecture](#)

**FORCES LAB** Match the following terms.

Compression		Pulling or Stretching
Tension		Twisting
Torsion		Pushing or Squeezing
Shear		Sliding

**LOADS LAB** Define the following terms in your own words

Dead load: **The weight of the structure itself.**

Live Load: **The weight a structure can hold.**

Thermal

OneNote  
for recording  
lab notes

AIG Building Big 5

NC Commerce Civil Engineering Bridge Basics class notes +

□ 2--Bridge Basics

EQ: How do forces, materials, and shapes effect bridge design and efficiency?

Resources:

- Refer back to you notes: 1-Bridge Basics
- [PBS: Bridge Basics](#)
- [PBS: Loads Lab](#)

As civil engineers, you will be focusing most of your attention on three main design factors:

- Dead Load The weight of the structure itself like nuts, bolts and beams.
- Live Load The thing in the structure or out of the structure.
- Span The distance a bridge extends between two supports.

Using the space below, create a graphic organizer describing each of these factors and include images to help provide visual explanations.

span

# Paper & Pencil Assessment

## Exit Ticket—Civil Engineering

2014

Match each vocabulary with a synonym that will help you remember:

- |                      |               |
|----------------------|---------------|
| 1. _____ Compression | A. Twisting   |
| 2. _____ Shear       | B. Stretching |
| 3. _____ Tension     | C. Sliding    |
| 4. _____ Torsion     | D. Squeezing  |

Forces that act on a structure are called loads. All structures must withstand loads or they will fall apart. In order to build a structure, you must understand what types of external forces will effect it.

Identify at least 4 “loads” that civil engineers must consider before designing a bridge.

- |          |          |
|----------|----------|
| 1. _____ | 3. _____ |
| 2. _____ | 4. _____ |

# Exit Ticket using Edmodo Quiz

The screenshot shows the Edmodo interface for a quiz titled "Forces Review Matc...". The quiz is due on Feb 26, 2016. The user's score is 100/100. The quiz content includes a matching exercise with five items (A-E) and five definitions (1-5). The items are: A Load, B Dead Load, C Live Load, D Compression, and E Tension. The definitions are: 1 Something that creates a force on a structure, 2 The weight of the permanent parts of a structure (the bridge itself), 3 The weight of a structure's non-permanent parts (example: traffic, people), 4 A pressing force that squeezes a material together, and 5 A stretching force that pulls on a material. The correct answers are indicated by green buttons.

**Forces Review Matc...**  
Due Feb 26, 2016

Showing: All

5th AIG Summersill

**100/100**  
Total Points:

Time Taken: 01:00 | Turned in Feb 25, 2016 @ 10:11 AM  
Graded | Delete

1

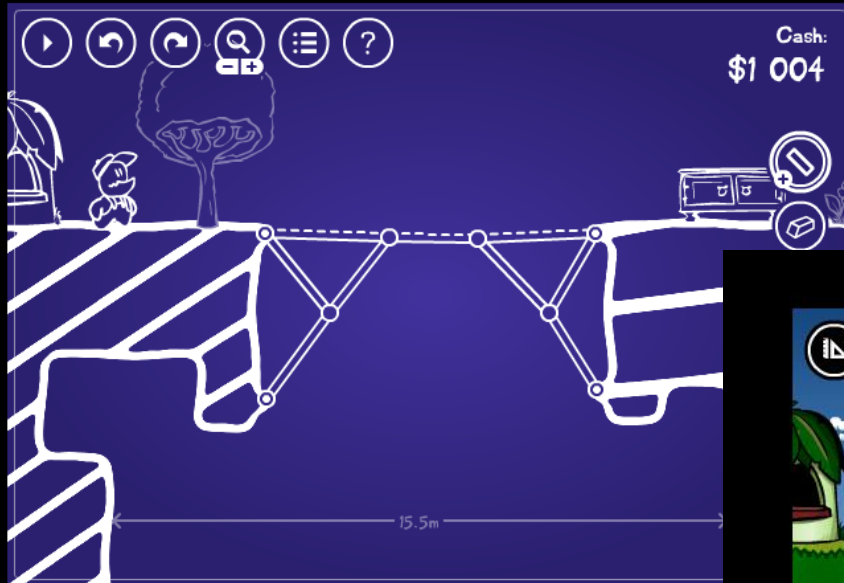
Question Total: 100 points

Match each letter with the correct answer.  
\*You can refer back to your Building BIG notebook at anytime to help you complete the quiz. 100% earns you an Edmodo Badge!

A	Load	1	Something that creates a force on a structure	Correct Answer
B	Dead Load	2	The weight of the permanent parts of a structure (the bridge itself)	Correct Answer
C	Live Load	3	The weight of a structure's non-permanent parts (example: traffic, people)	Correct Answer
D	Compression	4	A pressing force that squeezes a material together	Correct Answer
E	Tension	5	A stretching force that pulls on a	Correct Answer

# Cargo Bridge

- Linked in Symboloo & OneNote
- Provides valuable practice for early finishers
- Saves progress on same 1:1 device



**Common Core State Standards**  
CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving  
CCSS.Math.Practice.MP7 Look for and make use of structure.



**Common Core State Standards**  
CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.  
CCSS.Math.Practice.MP7 Look for and make use of structure.

## Common Core State Standards

CCSS..MP1 Make sense of problems and persevere in solving them.  
CCSS. MP7 Look for and make use of structure.

# TPT: Bridges 1 and 2 Bundle

made by The Helpful Teacher Next Door \$3.00

## The Truss Bridge

Complete each sentence with a word that makes the sentence true.

Most of the earliest bridges were beam bridges, but the truss bridge is the earliest "modern" bridge.

Truss bridges are similar to beam bridges.

Truss bridges are categorized by the three categories of truss bridges.

## The Truss Bridge

Complete each sentence with a word that makes the sentence true.

Most of the earliest bridges were \_\_\_\_\_ bridges, but the \_\_\_\_\_ bridge is the earliest "modern" bridge.

Truss bridges are similar to beam bridges, except the truss bridge has \_\_\_\_\_.

Truss bridges are categorized by the location of the trusses compared to the \_\_\_\_\_.

The three categories of truss bridges are \_\_\_\_\_ and \_\_\_\_\_.

**Vocabulary Practice**

From the passage, beam most likely means:

☐ Metal beams on wheels

From the passage, initially must mean:

☐ new

From the passage, locomotive means:

☐ movement

From the passage, reinforced must mean:

☒ person in a club

From the passage, categorized means:

☐ metal beams on wheels

☐ supports

☐ cables

☐ none

## The Truss Bridge

You already know about three types of bridges: beam bridges, arch bridges, and suspension bridges. There are several other types of bridges including truss, cantilever, and cable-stayed bridges. The first truss bridge is made like the beam bridge, except it has a truss structure. Truss bridges are much more rigid than beam bridges. In addition, the triangular structure of the truss helps to distribute the bridge's load over a larger area. Due to this distribution of forces, truss bridges can be much longer than beam bridges.

While beam bridges are the oldest type of bridge, truss bridges are the earliest form of "modern" bridges. The first truss bridges were made of wood. Wood worked well initially, but due to weather, the wood would become weak from rot. Some bridge builders attempted to solve this problem by putting a roof or cover on the bridge. These covered bridges can still be seen today. Another problem with wood bridges was the load the wood could support. The first versions of the locomotive were very small and not very heavy. As locomotives improved, they became significantly faster and heavier. Many wooden truss bridges needed reinforcement with iron or steel. Some were torn down and replaced with newer versions of the truss bridge.

Truss bridges were categorized by the location of their trusses. The three categories are a through truss, deck truss, or pony/truss-through truss. Trusses are positioned higher than the deck of the bridge in a through truss bridge. If the trusses are lower than the deck, then the bridge is a deck truss. When the trusses extend both under and above the roadway, it is called a half-through or pony truss.

Can you tell to which category these bridges belong? What is the deck or roadway?

## The Types of Truss Bridges

While there are many different designs for truss bridges, the pictures below show the basic structure of the three categories of truss bridges.


### Truss Designers, Bridge Building, and Civil Engineers

**William Howe**

One new truss bridge design was engineered by a farmer named **William Howe**. Howe was aided by the brothers Almy and Isaac in New York that would support the weight of the truss.

Howe knew wood alone was not strong enough to support the increased weight of new locomotives. He decided to use wood diagonal members and nonvertical ties. He was then asked to build this type of bridge over the Connecticut River. He received two patents for his bridge design in 1840 and another in 1862. Howe's design and bridge projects were so successful that he left farming to become a full-time bridge builder. He was even invited to travel to Russia to engineer bridges.

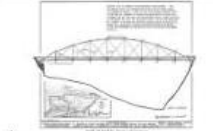
According to H&R (Historic American Engineering Records), there are over 100 covered Howe Truss bridges still standing in the United States. These bridges were not built by Howe, but did make use of his patented truss.



**Squire Whipple**

Although he began as a designer of mathematical instruments, another man helped to change bridge building in the 1840s. **Squire Whipple**, working for several companies in New York, also saw the advantage of using metal for bridge building. In 1847 Whipple used both cast iron and wrought iron in his bridges. His patented design was referred to as the **Swinging Truss**. Can you tell from the picture below why it has this name?

Whipple preferred to use mathematics to determine the load of each bridge he designed, which was very unusual in his time. Mathematical calculations enabled him to know the type of metal and the size of individual parts he'd need. Future bridge designers used Whipple's mathematical approach in order to avoid costly and dangerous errors. Whipple became known as the "Father of Iron Bridges".



### Deck Truss Bridge

Trusses are positioned below the deck or roadway.

Find an example of an existing deck truss bridge location.

### Fun Fact

This cartoon, Eliza Howe, patented the sewing machine.

Page Created by The Helpful Teacher Next Door 2014

## Truss Designers, Bridge Building, and Civil Engineering

Use what you have learned about these two bridge builders to complete the Venn diagram. Use the word bank below.

**KEY**

**William Howe**

- Farmer
- Built the Howe Truss

**Squire Whipple**

- Lived in New York
- Used iron in his bridge design
- Received a patent for his bridge design

**Intersection:**

- Mathematical instrument designer
- Designed Swinging Truss
- "Father of Iron Bridges"
- Used

Page Created by The Helpful Teacher Next Door 2014

# Phase 3: Business Design

## Essential Questions:

- ▶ What factors do businesses consider when deciding on a name & slogan?
- ▶ What make a successful logo?

### CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

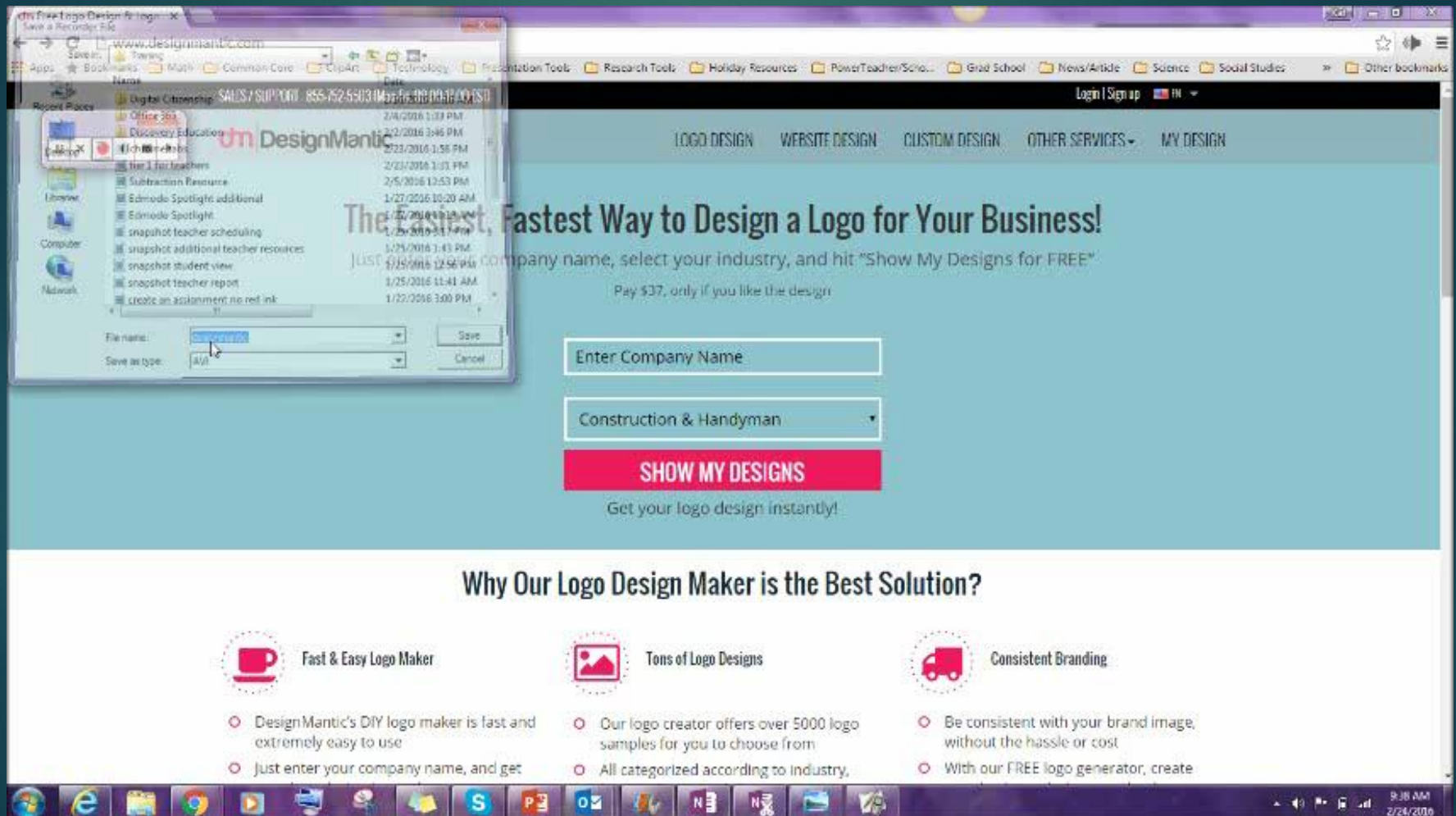
# Phase 3: Business Design

## OneNote Collaboration Space

- ▶ Business Name, Slogan, and Logo
- ▶ Logo Flip Lesson
  - [Postermyswall.com](http://Postermyswall.com)
  - [DesignMantic.com](http://DesignMantic.com)
- ▶ Teamwork, compromise, and collaboration.



# DesignMantic



The screenshot shows a Windows desktop with a File Explorer window open over the DesignMantic website. The File Explorer window displays a list of files and folders, including 'Office 2013', 'Discovery Education', 'Flash Player', 'Item 1 for teachers', 'Subtraction Resource', 'Edmodo Spotlight additional', 'Edmodo Spotlight', 'snapshot teacher scheduling', 'snapshot additional teacher resources', 'snapshot student view', 'snapshot teacher report', and 'create an assignment no ret link'. The DesignMantic website is visible in the background, featuring a navigation bar with links for 'LOGO DESIGN', 'WEBSITE DESIGN', 'CUSTOM DESIGN', 'OTHER SERVICES', and 'MY DESIGN'. The main heading reads 'The Fastest, Fastest Way to Design a Logo for Your Business!' followed by the instruction 'Just enter your company name, select your industry, and hit "Show My Designs for FREE"'. Below this, there is a form with 'Enter Company Name' and a dropdown menu for 'Construction & Handyman'. A prominent red button labeled 'SHOW MY DESIGNS' is present, along with the text 'Get your logo design instantly!'. The website also includes a section titled 'Why Our Logo Design Maker is the Best Solution?' with three columns of benefits: 'Fast & Easy Logo Maker', 'Tons of Logo Designs', and 'Consistent Branding'. Each column lists specific advantages of the service.

**Fast & Easy Logo Maker**

- DesignMantic's DIY logo maker is fast and extremely easy to use
- Just enter your company name, and get

**Tons of Logo Designs**

- Our logo creator offers over 5000 logo samples for you to choose from
- All categorized according to industry,

**Consistent Branding**

- Be consistent with your brand image, without the hassle or cost
- With our FREE logo generator, create





## My Business Design

Wednesday, February 17, 2016

**EQ: What factors do businesses consider when deciding on a business name, slogan, and logo?**

Provided  
feedback  
using my  
iPad

1. What is your business name and slogan? Explain how your business describes you professionally, and how will they persuade others to hire you over other bridge building companies? Our business name is Wrench Monkeys Building Company. Our slogan is: "Better Get Your Monkey Wrench!" It describes us as builders (obviously). Our logo actually shows we're builders compared to A and A. We may show potential clients our other projects to persuade.

Are you worried at all about customers thinking that you build cars?

2. Explain the choices you made in your logo design. What makes it a professional logo? Again, our logo shows we're builders compared to A and A. It's professional because it's unique against other logos. We found a good picture and used the methods you showed us.

What are some of those logo design elements that you learned about?

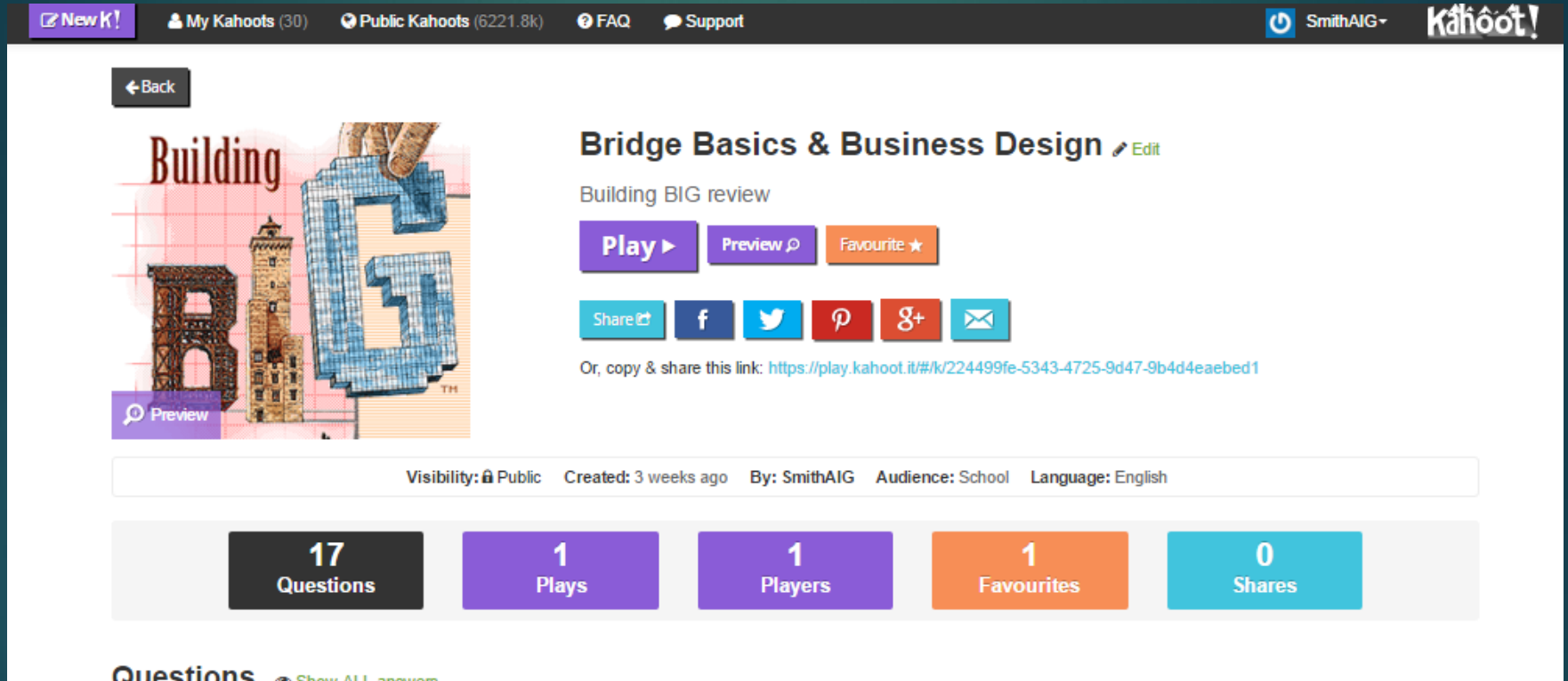
\* Review the logo PPT.

## Logo



Logo design was  
created with  
postermymwall.com

# Assess Using GetKahoot.com



The screenshot shows the Kahoot! interface for a quiz titled "Bridge Basics & Business Design". The quiz is categorized under "Building BIG review". It features a large graphic of the letters "BIG" where the "I" is a bridge tower and the "G" is a bridge arch. The interface includes a navigation bar at the top with links for "New K!", "My Kahoots (30)", "Public Kahoots (6221.8k)", "FAQ", and "Support". On the right, there's a user profile for "SmithAIG" and the Kahoot! logo. Below the quiz title, there are buttons for "Play", "Preview", and "Favourite". Social sharing options for Facebook, Twitter, Pinterest, Google+, and Email are also present. A link to the quiz is provided: <https://play.kahoot.it/#/k/224499fe-5343-4725-9d47-9b4d4eaebed1>. At the bottom, a summary bar shows: 17 Questions, 1 Plays, 1 Players, 1 Favourites, and 0 Shares. The word "Questions" is visible at the bottom left, followed by a link to "Show All answers".

← Back

**Bridge Basics & Business Design** Edit

Building BIG review

**Play** **Preview** **Favourite**

**Share** **f** **Twitter** **p** **g+** **Email**

Or, copy & share this link: <https://play.kahoot.it/#/k/224499fe-5343-4725-9d47-9b4d4eaebed1>

Visibility: **Public** Created: 3 weeks ago By: **SmithAIG** Audience: School Language: English

**17** Questions **1** Plays **1** Players **1** Favourites **0** Shares

Questions Show All answers

Before moving to Phase 4 of Construction, assess what your students have learned using GetKahoot.com. This one is public and free to use, duplicate, and/or edit to fit your needs.

# Assess Using Kahoot!

https://play.kahoot.it/#/question?quizId=224499fe-5343-4725-9d47-9b4d4eaebed1

Apps ★ Bookmarks Outlook Web App Home | Edmodo Office 365 AIG Specialist Quick... Academic Derby Ma... Kahoot! Teacher Home Page... OCS Employee Docs » Other bookmarks

Which is the strongest shape for construction?

9

Kahoot!

0 Answers

Skip

▲ triangle

◆ square

● rectangle

■ trapazoid

# Phase 4: Construction

## Essential Questions:

- ▶ Why is it important to develop a basic budget for spending and saving?
- ▶ How do I evaluate the costs and benefits of spending, borrowing and saving?
- ▶ How does reflecting throughout the engineering process help you be more successful in your end-product?



**COMMON CORE**  
STATE STANDARDS INITIATIVE  
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

# Mathematical Practice

- 1. Make sense of problems and persevere in solving them.**
- 2. Reason abstractly and quantitatively.**
- 3. Construct viable arguments and critique the reasoning of others.**
- 4. Model with mathematics.**
- 5. Use appropriate tools strategically.**
- 6. Attend to precision.**
- 7. Look for and make use of structure.**
- 8. Look for and express regularity in repeated reasoning.**

# Building Code & Budget

<b><u>Design</u></b>	<ul style="list-style-type: none"><li>• Drawing of models are neat and legible</li><li>• Includes the actual distances of the spans and calculations of estimated materials needed</li><li>• Side truss view and bottom deck are drawn to scale &amp; labeled</li><li>• Purchase orders are completed before each purchase.</li><li>• Construction reports are kept up to date.</li></ul>
<b><u>Model</u></b>	<ul style="list-style-type: none"><li>• Bridge must span a 50cm river but not exceed 60 cm</li><li>• Bridge width (roadway) is between <math>7 \geq 11</math> cm</li><li>• Bridge has 5 cm height clearance in the roadway to allow for the testing block to be held along with a <math>2 \text{ cm}^2</math> opening to allow for the chain to hang</li><li>• Entire cost of building materials cannot exceed \$300,000 dollars</li></ul>

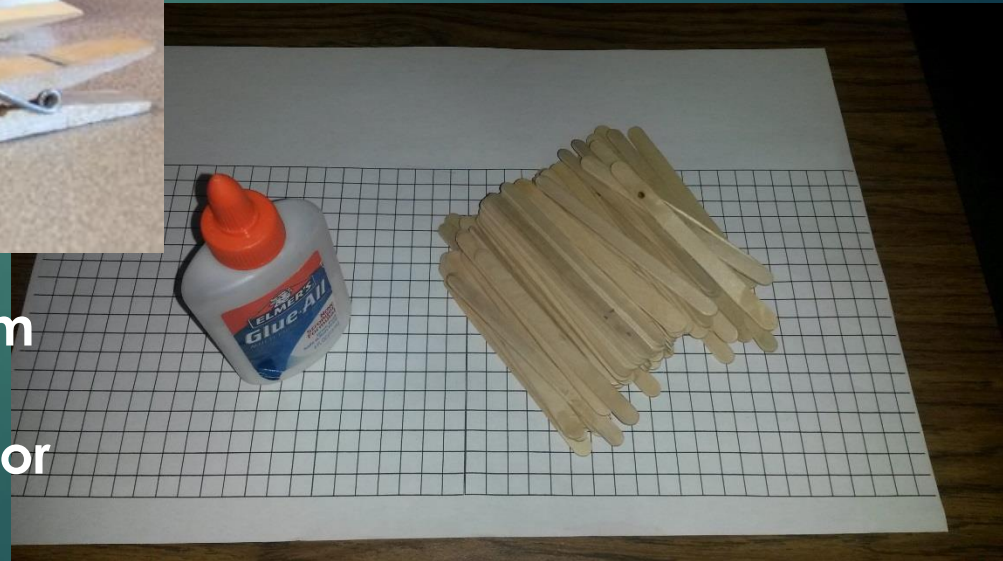


# Construction Materials Needed

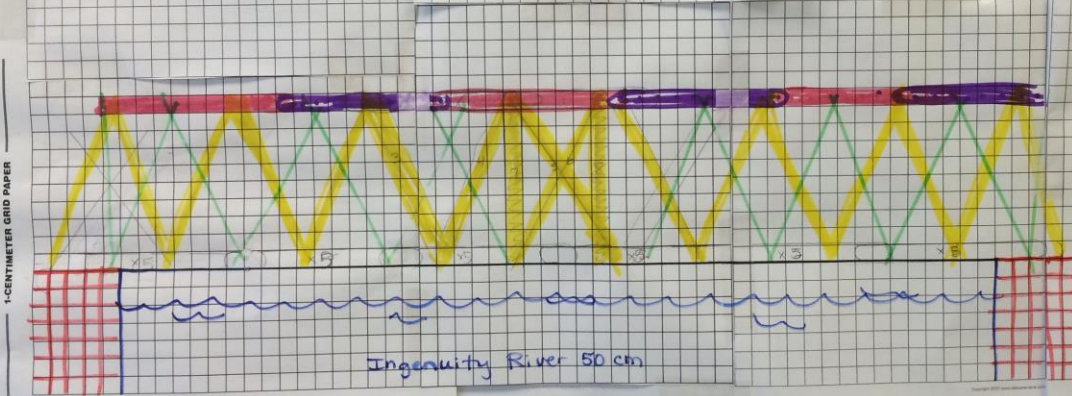
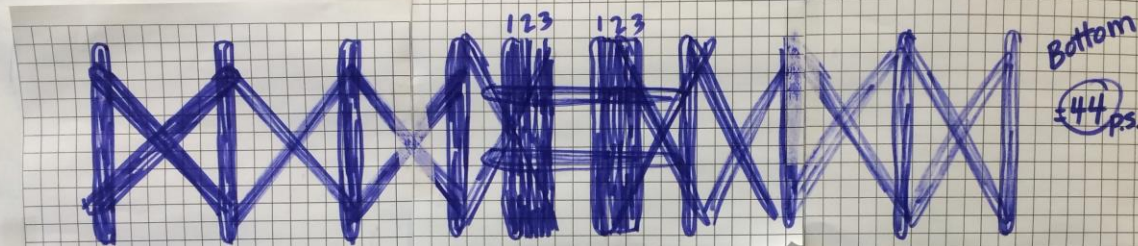


- 1 bottle of Elmer's White Glue per team
- At least 250 popsicle sticks per team
- Centimeter grid paper

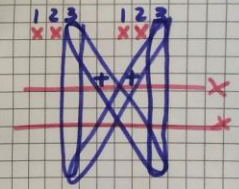
- Storage container for each team
- About 25 wooden clothes pins for each team (clamps)



# Blueprints & Estimates



Top same except center



$$\begin{array}{r}
 = 44 \\
 - 6 \\
 \hline
 38 \\
 + 2 \\
 \hline
 = 40 \text{ ps.}
 \end{array}$$

- 30 bottom beam  $\times 2 = 60$  bottom beams  
+ 6 for side + top 6  
 $12 \times 2 = 24$

- 18 yellow  $\times 2 = 36$
- 12 pink + purple  $\times 2 = 24$  (each side of top truss)
- 6 top  $\times 2 = 12$

Total Estimate of sticks:

$$\begin{array}{r}
 84 + 84 + (36 \times 2) \\
 168 + 72 \\
 \hline
 240
 \end{array}$$

30 x 2 = 60



# Purchase Orders & Salvage

\_Content Library Civil Engineering Bridge Basics Business Information Other Resources

## Purchase Orders

Date of Purchase Order	# of Popsicle Sticks	\$ Cost of Sticks	Starting Budget \$ 300,000
	# of Glue Bottles	\$ Cost of Glue	
1	# Sticks--	\$ Sticks--	- Cost of Purchase:
	# Glue--	\$ Glue--	Ending Budget \$
2	# Sticks--	\$ Sticks--	- Cost of Purchase:
	# Glue--	\$ Glue--	Ending Budget \$
3	# Sticks--	\$ Sticks--	- Cost of Purchase:
	# Glue--	\$ Glue--	Ending Budget \$
4	# Sticks--	\$ Sticks--	- Cost of Purchase:
	# Glue--	\$ Glue--	Budget Saved:

## Salvage Credits

Sticks	# of Salvage Sticks (overspent; undamaged)	x Salvage Credit \$250 per stick	+ Salvage Credit:
			Budget Saved \$:
Glue	Weight of Salvaged Glue (Weight of bottles - 45 g per bottle)	x Salvage Credit \$ 125 per gram	+ Salvage Credit:
			Final Budget Saved \$:

OneNote Collaboration Space

Code & Budget Form

Password Protected!

Starting Budget:	Final Budget Saved:	= Total Cost of Bridge
\$300,000	- \$	\$

Building BIG  
\_Content Library ▼ 5

Civil Engineering Bridge Basics Business Information

## Weekly Construction Report

Company Name:

Goals for the Week:

- 

Reflections and Next Steps:

Budget Analysis:

- 
- 

Summary of Construction:

Use this space to summarize the main things you did this week.

- 
- 

Next Steps

What should next week's goals be? What are your next steps in construction?

- 
- 

## OneNote Collaboration Space

- Helps students set goals and plan ahead
- Increases communication & collaboration
- Encourages reflection throughout the building process

# Phase 5: Final Analysis



## Essential Questions:

- ▶ Why is it important to develop a basic budget for spending and saving?
- ▶ How do I evaluate the costs and benefits of spending, borrowing and saving?
- ▶ How does reflecting throughout the engineering process help you be more successful in your end-product?

# Salvage Credits

	# Glue--	\$ Glue--	Budget Saved:
<b>Salvage Credits</b>			
Sticks	# of Salvage Sticks (overspent; undamaged)	x Salvage Credit \$250 per stick	+ Salvage Credit:
			Budget Saved \$:
Glue	Weight of Salvaged Glue (Weight of bottles – 45 g per bottle)	x Salvage Credit \$ 125 per gram	+ Salvage Credit:
			Final Budget Saved \$:

Starting Budget:	Final Budget Saved:	= Total Cost of Bridge
\$300,000	- \$	\$

**Bottom portion  
of Code &  
Budget form**

**EQ: Why is it important to develop a basic budget for spending and saving?**

**EQ: How do I evaluate the costs and benefits of spending, borrowing and saving?**

Company: \_\_\_\_\_

Engineer(s): \_\_\_\_\_

### Final Bridge Analysis

**OneNote  
Collaboration  
Space**

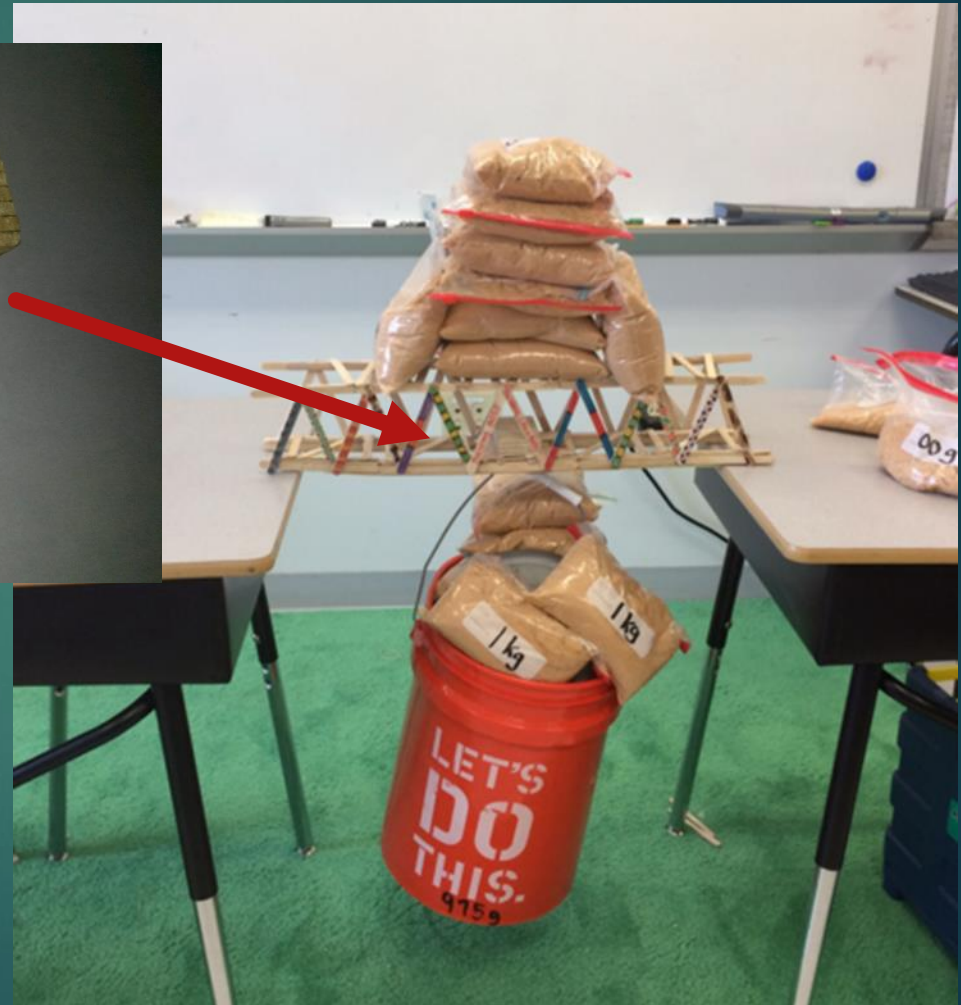
#### **\$ Spending Analysis \$**

What was your total cost of your bridge?	\$			,			.
How much of that money was spent on sticks?	\$			,			.

How many sticks did you purchase during your build?			
How many of whole sticks did you salvage?	-		
How many <u>whole</u> sticks are actually part of your final bridge?	=		

Analyze and reflect upon how your company used the budget you were given to build your bridge. Describe at least two positive things your company did in spending as well at least one way you could have saved more money.

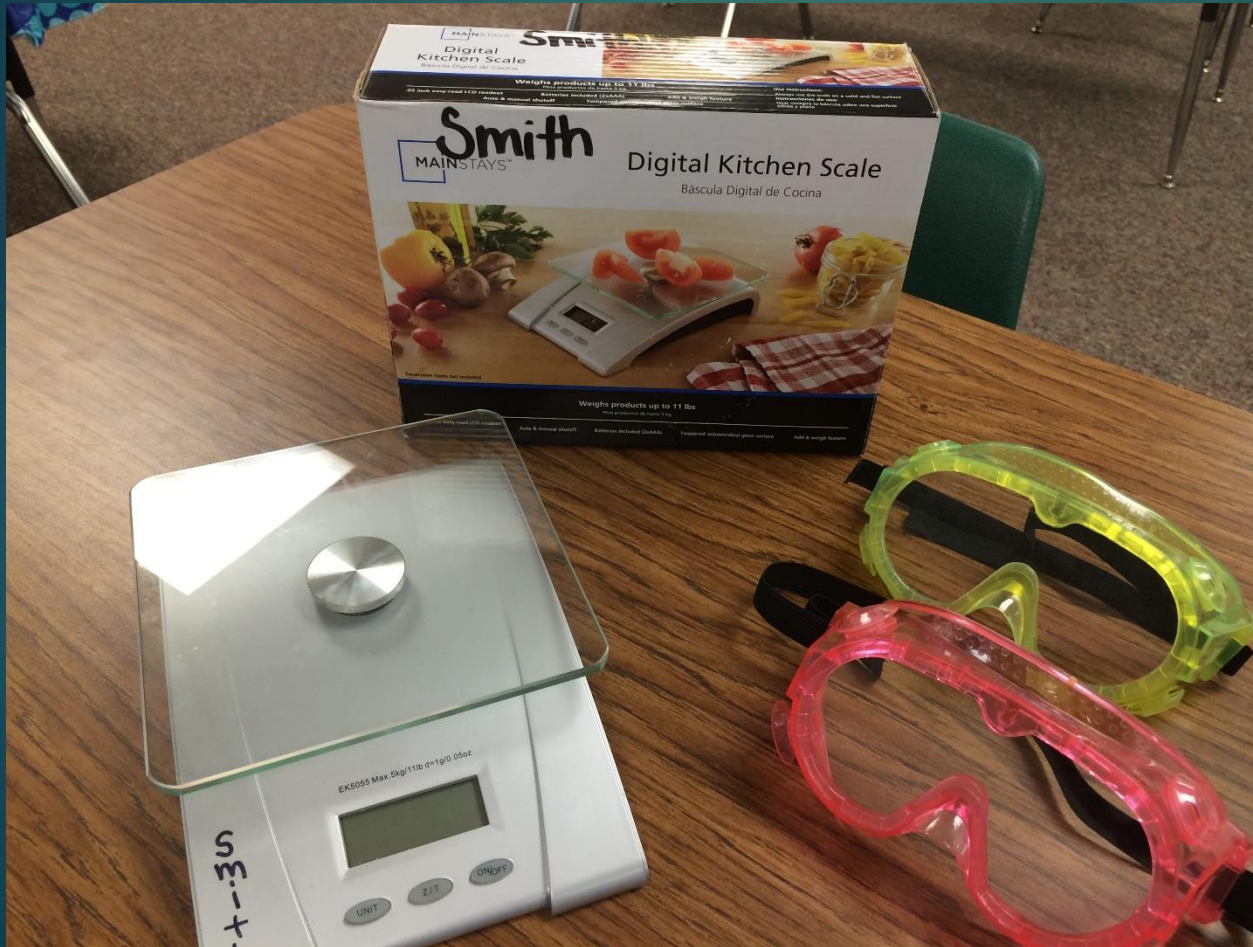
# Testing Materials Needed:



- Testing Block
- Strong bucket (Home Depot)
- 50lb bag of Playground Sand
- Strong Ziploc bags

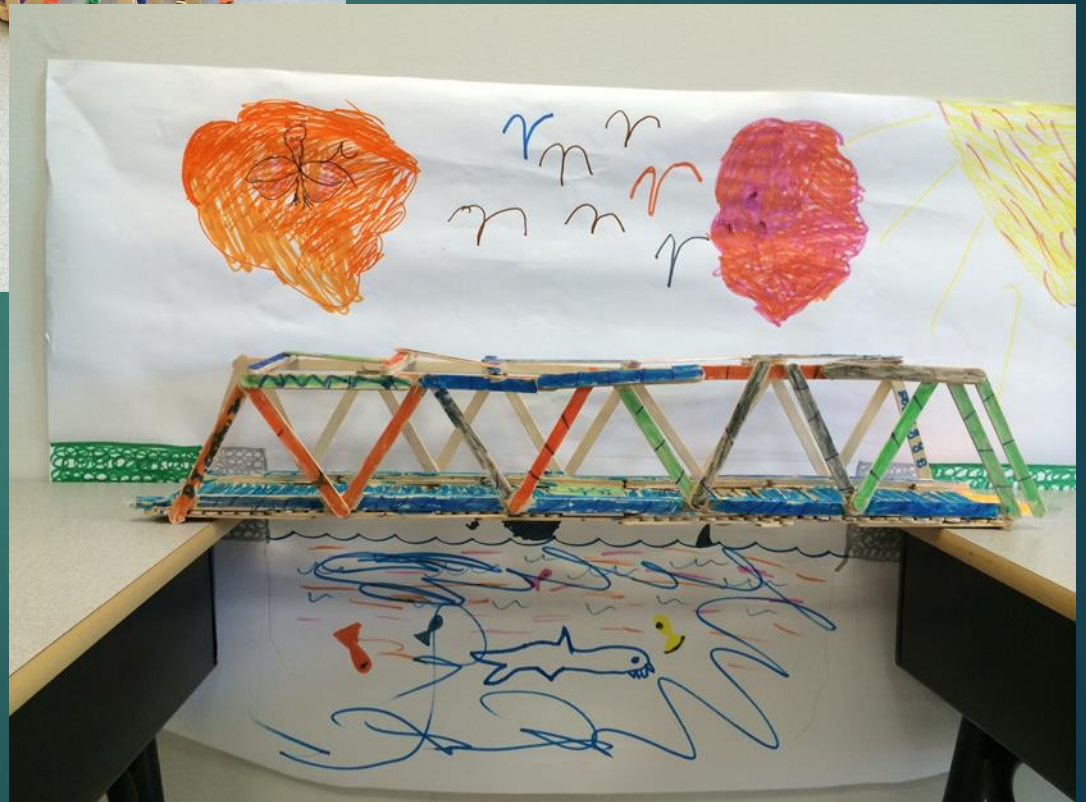
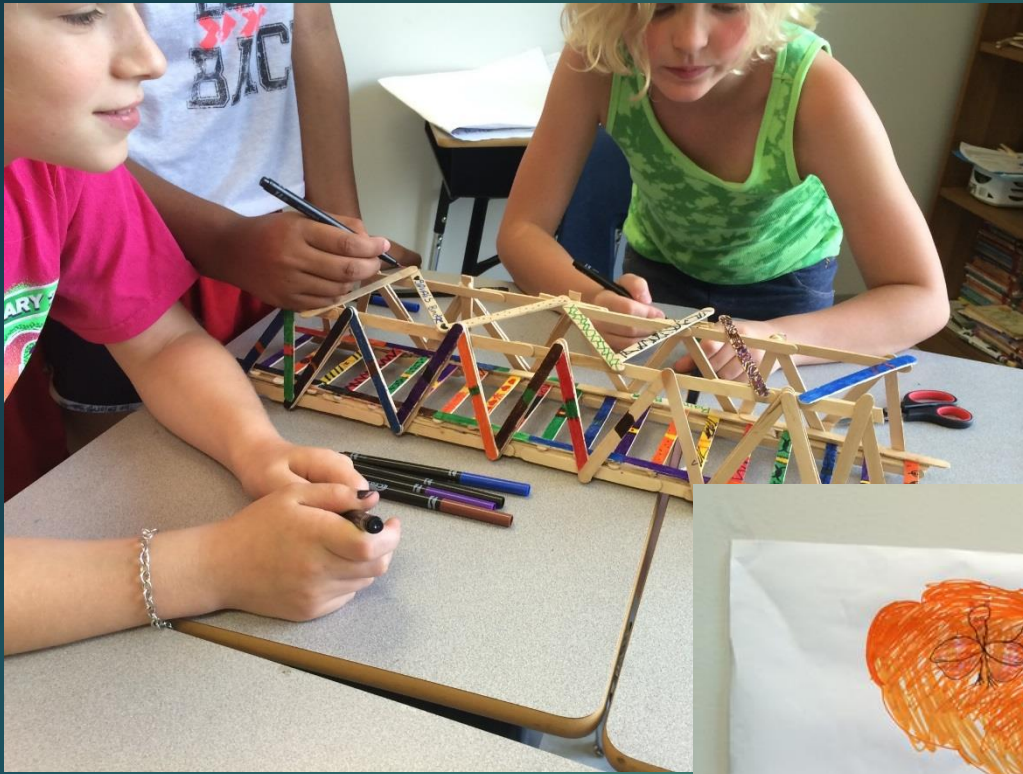


# Testing Material Needed:

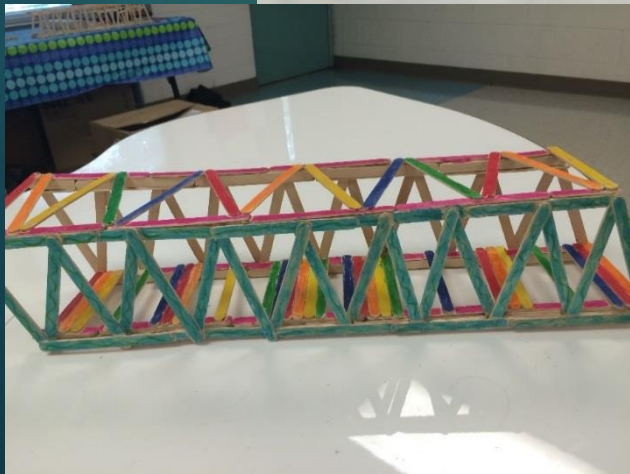
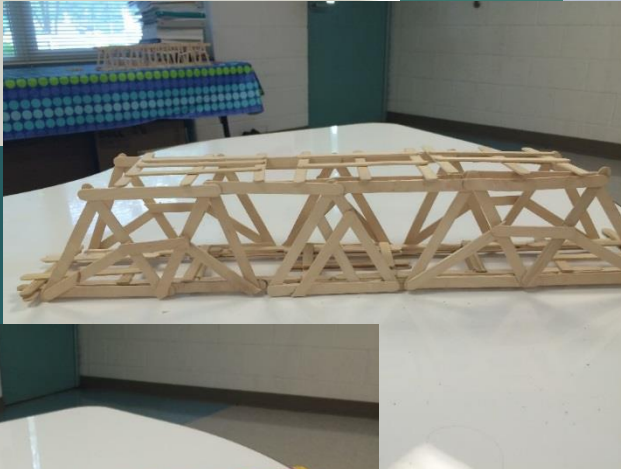
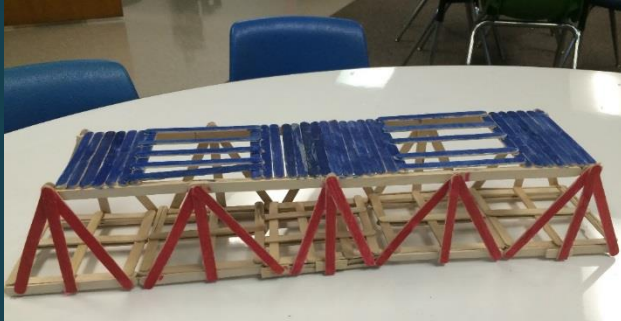


- Digital Scale (g)
  - Dead Load
  - Sand Bags
  - Glue Salvage
- Safety Goggles





# 2015 Bridges



# Budget Score + Efficiency Score = Overall Score

Final Budget Saved:	÷ Beginning Budget	= % of Budget Saved
	÷ \$300,000	_____ %

Efficiency Rating Test		
Live Load	÷ Dead Load	= Efficiency Rating
	÷	=

Overall Score		
Efficiency Score	+ % of Budget Saved	= Overall Score
	+	=

**Bottom portion  
of Final Bridge  
Analysis**



# 2015—Movie Maker



# FIRST PLACE ENGINEER

This certificate is awarded to

---

for designing & constructing the most efficient bridge & budget overall.

**Summersill Elementary AIG 2015**



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AIG Specialist

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Date

# FIRST PLACE ENGINEER

This certificate is awarded to

---

for designing & constructing a bridge that held the most weight.

**Summersill Elementary AIG 2015**



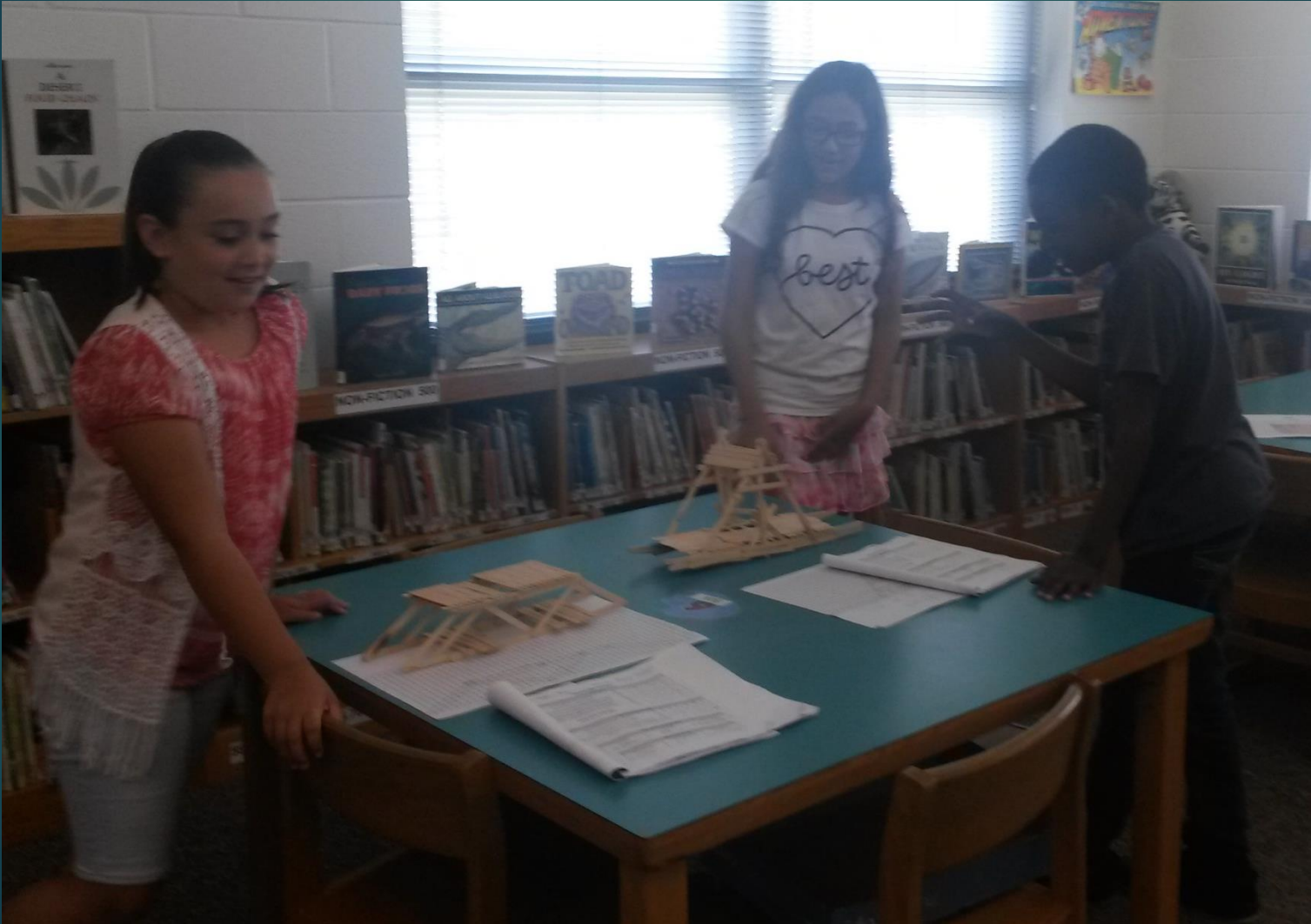
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AIG Specialist

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Date

# Engineering Fair





# Engineering Bridge Fair



**COMPANY: KHA COMPANY**

**ENGINEERS:**

**EFFICIENCY RATING: 69.37**

**BRIDGE COST: \$164,800**

**ENGINEERING INSPECTOR: MRS. MARIA BURDETTE**

Join our Edmodo  
Group for all the  
resources from  
today!



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